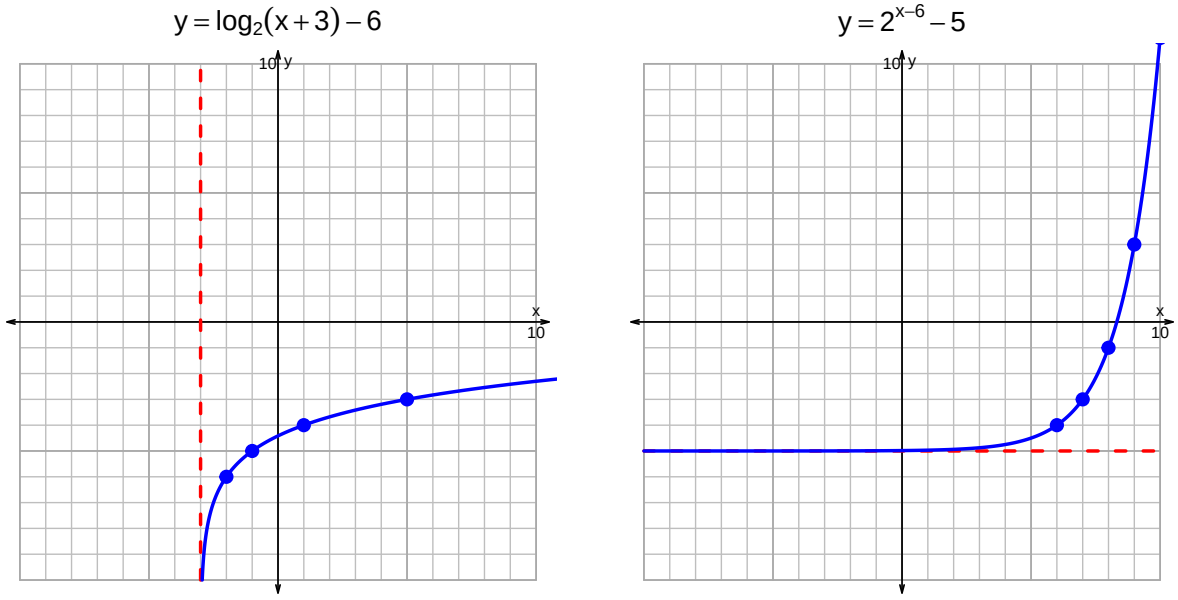
Name: Date:

s18quiz: EXP LOG (Solution v119)

1. Graph $y = \log_2(x+3) - 6$ and $y = 2^{x-6} - 5$ on the grids below. Also, draw any asymptotes with dotted lines.



2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression.

$$-13 = \left(\frac{-7}{4}\right) \cdot 2^{3t/5}$$

Divide both sides by $\frac{-7}{4}$.

$$\frac{13 \cdot 4}{7} = 2^{3t/5}$$

Take log, base 2, of both sides.

$$\log_2\left(\frac{13 \cdot 4}{7}\right) = \frac{3t}{5}$$

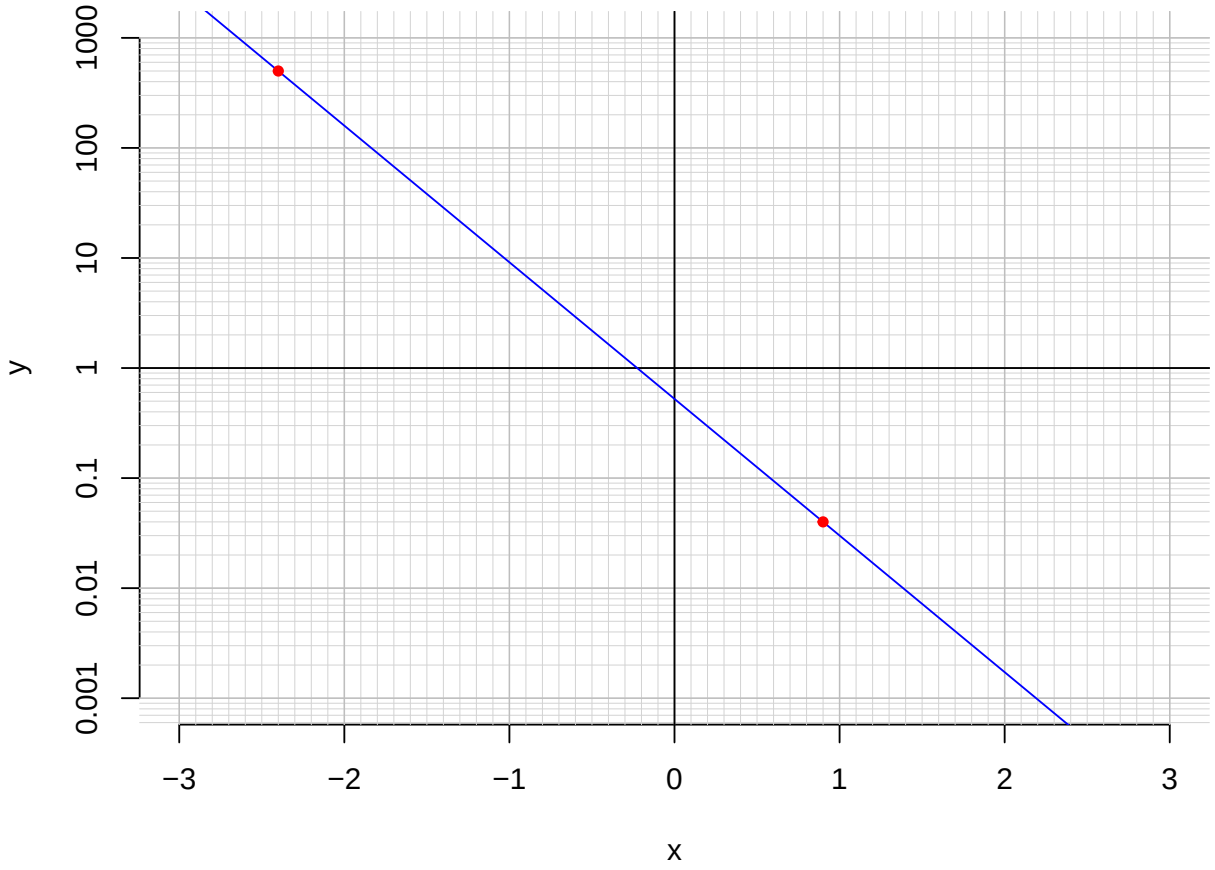
Divide both sides by $\frac{3}{5}$.

$$\frac{5}{3} \cdot \log_2\left(\frac{13 \cdot 4}{7}\right) = t$$

Switch sides.

$$t = \frac{5}{3} \cdot \log_2\left(\frac{13 \cdot 4}{7}\right)$$

3. An exponential function $f(x) = 0.524 \cdot e^{-2.86x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(0.9)$.

$$f(0.9) = 0.04$$

b. Express $f^{-1}(x)$, the inverse of f.

$$f^{-1}(x) = \frac{-1}{2.86} \cdot \ln\left(\frac{x}{0.524}\right)$$

c. Using the plot above, evaluate $f^{-1}(500)$.

$$f^{-1}(500) = -2.4$$